

1. Please **REPLACE** the pending paragraph of the specification that starts at **page 1, line 3** with the following paragraph:

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This application is a continuation of Application Serial No. 09/276,085 filed March 25, 1999. Application Serial No. 09/276,085 claims priority under 35 U.S.C. §120 from now abandoned International Application PCT/US98/20597, filed 30 September 1998, with respect to all shared subject matter.

2. Please **REPLACE** the pending paragraph of the specification that starts at **page 3, line 11** with the following paragraph:

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The techniques described by Södergård et al. and Robinson et al. may lead to advances, but were developed with other objectives in mind and are not well-suited to efficiently obtaining an automatic action appropriate to a specific physical object. The Södergård technique relies on OCR of any of a number of anchor words that appear in a book, and each anchor word is linked to a URL through a link list; but an anchor word appears to produce the same URL independent of the book in which it appears. The Robinson technique requires a complex sequence in which a Web page is retrieved, then printed, then pointed to on the DigitalDesk. In general, these and other conventional techniques do not provide automatic actions appropriate to physical objects through a network in a non-disruptive streamlined manner.

3. Please **REPLACE** the pending paragraph of the specification that starts at **page 10, line 15** with the following paragraph:

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When the type is "digital-page", router 802 provides the network address of digital page 6, which can be a digital page counterpart of document 2 that is stored on a server connected to the network. Pointer 502 or associated circuitry can (1) save the network address of digital page 6 in a digital-page-address store, and (2) send location code loc, serving as an action identifier, and the network address of display 4 from the peripheral-address store to the digital page's network address.

4. Please **REPLACE** the pending paragraph of the specification that starts at **pag**

11, lin 18 with the following paragraph:

Various routing techniques that may be employed are described in greater detail in copending, coassigned U.S. Patent Application 09/276,084, entitled "Using Identifiers to Obtain Network Addresses, incorporated herein by reference.

5. Please **DELETE** the pending paragraph of the specification that starts at **page 12, line 6 and continues to line 12.**

6. Please **REPLACE** the pending paragraph of the specification that starts at **page 12, line 13** with the following paragraph:

Each 0.5 cm by 0.5 cm square zone or cell of machine-readable markings can hold, for example, 256 bits of reliable information. Of these, 128 bits can hold the page-identifier (which is thus redundantly repeated on each cell of a page), and 16 bits can hold the cell localization (or cell address or location code) on the page. 16 bit location codes correspond to a maximum number of 65536 cells on a page, which in turn corresponds to a 123cm x 123cm maximum size page. 112 bits are left for other information, such as a page-id-code that can be used for authentication or data private to the publisher.

7. Please **REPLACE** the pending paragraph of the specification that starts at **page 13, line 34** with the following paragraph:

an encoded representation of a page-identifier, i.e. an item of data whose value uniquely identifies the page, within cell border 204, such as a first set of markings 208; and

8. Please **REPLACE** the pending paragraph of the specification that starts at **page 14, line 9** with the following paragraph:

Figure 4 illustrates components of a document printed on a coded substrate. Printed document 102 comprises layer 104 of printed visible (human-readable) information, i.e. document content, printed on coded substrate 106, illustratively a

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contd.

segment of a map though layer 104 could include text, photographic images, or any other human-readable information. The coded substrate 106 in turn comprises a layer 108 of visible or invisible machine-readable markings printed on a sheet medium 110 (e.g. paper).

9. Please **REPLACE** the pending paragraph of the specification that starts at **page 15, line 35** with the following paragraph:

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09/144,250

The encoded location identifiers in a non-positional implementation could, for example, be DataGlyph address space fragments of the type described in copending, coassigned U.S. Patent No. 5,937,110, entitled "Parallel Propagating Embedded Binary Sequences for Characterizing Objects in N-Dimensional Address Space", incorporated herein by reference. Other markings could be used, such as bar codes, icons, circled numbers in an OCR font, and so forth. The robustness of the non-positional implementation increases with the ease of recognition of the markings, while the document looks better as the intrusiveness of the marks decreases, and particularly as the marks remain recognizable when partially occluded, metrics on which DataGlyphs perform well.

10. Please **REPLACE** the pending paragraph of the specification that starts at **page 16, line 16** with the following paragraph:

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As mentioned above, a detection device or detection circuitry can provide input signals that include information defining the machine-readable markings, and processing circuitry can use the input signals to obtain an action/medium identifier. The detection device or circuitry and the processing circuitry could take any appropriate form. Some examples are illustrated in Figs. 8-11. Other examples of detection devices that could be used are described in copending, coassigned U.S. Patent Application Nos. 09/144,250, entitled "Methods and Apparatus for Camera Pen"; 09/144,251, entitled "Glyph Address Carpet Methods and Apparatus for Providing Location Information in a Multidimensional Address Space"; and 09/223,882, entitled "Multi-level Selection Methods and Apparatus Using Context Identification for Embedded Data Graphical User Interfaces", all incorporated herein by reference.

11. Please **REPLACE** the pending paragraph of the specification that starts at **page 18, line 32** with the following paragraph:

Figure 11 schematically illustrates features of a pointer that may be used in implementing the invention. Pointer 502 comprises pointing device 504, which may have tip 505, and image capture device 506, which can be a camera or another type of image input circuitry. In use, image capture device 506 is able to capture images of an area A of a document 508, which can be implemented with a coded substrate as illustrated in Figs. 3-7. For the sake of illustration, the sizes of the components of pointer 502 are exaggerated, and pointing device 504 is shown parallel to image capture device 506 although they could be differently oriented -- e.g. in practice, area A may be much closer to tip 505 of pointing device 504 than appears in Fig. 11, so that a user may easily determine from tip 505 where area A is located. In certain embodiments, pointing device 504 may be omitted. In others, pointing device 504 may also be a pen or any other marking device suitable for making marks on a coded substrate that are visible to a user. If pointing device 504 is a marking device, it functions as a combination writer-pointer. Image capture device 506 can monitor the position of tip 505 in real time, and marks can be recorded in digital form concurrently with their physical production. This allows capture of handwritten notes. If pointer movements are time stamped, the dynamicity of the strokes can be recovered to preserve the time and order of each annotation and its relations to other events, such as events in a video recording; related techniques are described in copending, coassigned U.S. Patent Application No. 09/276,532, entitled "Obtaining and Using Data Associating Annotating Activities With Portions of Recordings", incorporated herein by reference. The dynamicity of the strokes can also be used in signature authentication and handwriting recognition. Editor's marks handwritten on a draft typescript can be interpreted in real time to produce a corrected version. If the pointer is wireless, notes can be available online, allowing applications such as the transmission of handwritten faxes without a fax machine nearby.

12. Please **REPLACE** the pending paragraph of the specification that starts at **page 20, line 17** with the following paragraph:

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In the seventh box, the processing circuitry branches based on the type received from the router or retrieved from cache. If the type is peripheral, the processing circuitry follows the right branch in Fig. 12, and sets its peripheral address to the network address received from the router or retrieved from cache. If the type is digital page, the processing circuitry follows the left branch, first setting its digital page address to the network address and then sending the peripheral address and loc to the digital page address.

13. Please **REPLACE** the pending paragraph of the specification that starts at **page 32, line 35** with the following paragraph:

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Related techniques are described in copending, coassigned U.S. Patent Application No. 09/223,882, entitled "Multi-level Selection Methods and Apparatus Using Context Identification for Embedded Data Graphical User Interfaces", incorporated herein by reference.

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14. Please **REPLACE** the pending paragraph of the specification that starts at **page 38, line 30** with the following paragraph:

It will be appreciated that the techniques described herein may also be used in conjunction with the related techniques described in copending, coassigned U.S. Patent Application Nos. 09/276,532, entitled "Obtaining and Using Data Associating Annotating Activities With Portions of Recordings", and 09/276,084, entitled "Obtaining Network Addresses from Identifiers", both incorporated herein by reference.